

1. (Currently Amended) A composition comprising a colloidal dispersion of calcium phosphate platelets, comprising calcium phosphate platelets, wherein the length of the platelets, L, is between 5 and 500 nm and the thickness of the platelets is between 0.5 and 20 nm, and at least one polymer which complexes calcium.

2. (Previously Presented) The colloidal dispersion according to claim 1, wherein the length of the platelets, L, is between 5 and 300 nm.

3. (Previously Presented) The colloidal dispersion according to claim 2, wherein the thickness of the platelets is between 0.5 and 15 nm.

4. (Previously Presented) The colloidal dispersion according to claim 1, wherein the calcium phosphate platelets exhibit one of a monetite or apatite structure.

5. (Previously Presented) The colloidal dispersion according to claim 1, wherein the at least one polymer which complexes calcium comprises at least one of a carboxylate, phosphate or phosphonate anionic functional group.

6. (Previously Presented) The colloidal dispersion according to claim 1, wherein the at least one polymer which complexes calcium is selected from the group consisting of polymers with a peptide backbone of polyaspartic acid, polyglutamic acid, polylysine or polyglycine, homopolymers and copolymers of acrylic acid, methacrylic acid, polyacrylic acid or polymethacrylic acid, copolymers of the polyacrylic-polymethacrylic, polyacrylic-polyhydroxyethylacrylic or polyacrylic-polyacrylamide, polysaccharide polymers, guar gum, carboxymethylcellulose or xanthan gum, modified polysaccharide polymers having phosphate or phosphonate functional groups, and peptide polymers comprising phosphate functional groups.

7. (Previously Presented) The colloidal dispersion according to claim 5, wherein the molar ratio of anionic functional groups present in the polymer to moles of calcium in the dispersion is between 0.0001 and 0.1.

8. (Previously Presented) The colloidal dispersion according to claim 1, wherein the at least one polymer which complexes calcium has a molecular weight of between 1000 and 20,000 g/mol.

9. (Previously Presented) The colloidal dispersion according to claim 1, wherein the colloidal dispersion further comprises at least one dispersing agent.

10. (Previously Presented) The colloidal dispersion according to claim 9, wherein the at least one dispersing agent is a polyphosphate.

11. (Previously Presented) The colloidal dispersion according to claim 9, wherein the molar ratio of dispersing agent to calcium is between 0.001 and 0.5.

12. (Previously Presented) The colloidal dispersion according to claim 1, wherein the dispersion further comprises doping elements selected from the group consisting of alkaline earth metal elements, rare earth metal elements, and elements with an atomic number of between 57 and 71.

13. (Previously Presented) Calcium phosphate platelets obtained by drying the colloidal dispersion of claim 1.

14. (Previously Presented) A method for preparing dispersions of calcium phosphate platelets, wherein the length of the platelets, L, is between 5 and 500 nm and the thickness of the platelets is between 0.5 and 20 nm, and at least one polymer which complexes calcium comprising the steps of:

- i) preparing a solution of calcium salts; and adjusting the pH to a selected value of between 4 and 6;
- ii) adding a phosphate solution to the solution obtained in step i) over a period of time of between 30 minutes and 4 hours, so as to obtain a calcium to phosphorus molar ratio of between 1 and 2.5, wherein the pH is maintained constant at the selected value of between 4 and 6 until a calcium phosphate platelet dispersion is formed;
- iii) heat treating the dispersion obtained in step ii) at a temperature of between 50°C and 95°C;
- iv) washing the dispersion obtained in step iii);
- v) adding a dispersion agent to the dispersion obtained in step iv);
- vi) separating the colloidal dispersion obtained in step v);

wherein in at least one of steps i) or ii), the solutions further comprise ammonium ions; and wherein at least one polymer which complexes calcium is added during step i) or ii).

15. (Previously Presented) The method according to claim 14, wherein the calcium solution is a CaCl<sub>2</sub> or Ca(NO<sub>3</sub>)<sub>2</sub> solution.

16. (Previously Presented) The method according to claim 14, wherein the concentration of the calcium solution is between 0.25M and 2.5M.

17. (Previously Presented) The method according to claim 14, wherein the phosphate salt solution is a solution of one of ammonium phosphate or sodium phosphate.

18. (Previously Presented) The method according to claim 14, wherein the calcium to phosphorus molar ratio in the solution of step ii is between 1.3 and 1.7.

19. (Previously Presented) The method according to claim 14, wherein the temperature of the heat treatment in step iii) is between 60°C and 90°C.

20. (Cancelled)